

The Effect of Pre-service Teachers' Epistemological Beliefs on Teaching Approaches*

Erdoğan Tezci*, Mehmet Akif Erdener, Sıtkı Atıcı

Department of Education Science, Necatibey Education Faculty, Balıkesir University, Turkey

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Abstract At the beginning of last century, the curriculum based on constructivist approach which is the essential of education reforms has become a foundation to solution seeking. It is obvious that the researches in literature could not provide the desired achievement. Only the existence of programs that are based on student centered approaches are not adequate for the qualified education. Teachers who implement these programs teaching approaches might be appropriate for student centered education perspective. Eventually teachers' teaching approaches affect students' learning styles and their learning process. There are various classifications in literature about teachers' learning and teaching approaches. The two most common classifications are constructivist and traditional approaches. Teachers' learning and teaching perceptiveness are affected by many variables. One of them is epistemological beliefs. Determining teachers' teaching perceptiveness and the epistemological beliefs contribute effective teacher education programs. The success of effort in educational reforms could be possible by pre-service teachers' and teachers' instruction that is based on contribution of epistemological beliefs and teaching approaches. The purpose of this study is to determine the influence of pre-service teachers' epistemological beliefs on teaching approaches. A cross-sectional survey design was employed and data were collected from 990 pre-service teachers in Turkey. Structural equation analysis using Partial Least Squares was used for statistical analysis of the data. Major findings indicated that epistemological beliefs which depend on effort and ability to learn have significant impact on constructivist teaching. The belief reference to existence of an only true has significant effect on traditional teaching. The beliefs which depend on effort have significant negative impact on traditional learning-teaching approach. According to the results of this study, pre-service teachers' believe that learning is based on existence of an only true and innate ability.

Keywords Teaching-learning Approach, Concept of Teaching-learning Concept, Beliefs, Epistemological Beliefs, Preservice Education

1. Introduction

The curriculum development studies underlie the reform efforts in education [17,87]. Increasing students' achievement and reducing qualitative and quantitative problems in education take part at the focus point of curriculum reform efforts. The success of reform efforts significantly depends on teachers' beliefs to these reforms and the relation between their teaching and learning approach and the reform efforts. Because teachers are the implementers of the curriculum in classrooms, teachers' adoption of the insight and the change that come along with the reforms and their designing of learning-teaching process become important as well as teachers' beliefs to necessity of reforms [8,74,99].

It has been seen that the teacher education programs have been undergoing change to increase the reform efforts in education [56,59,68]. The focus point of teacher education programs is that teachers' anticipation for the changes in the learning-teaching paradigms. One of these paradigms is a changeover from teacher centered education to student centered education [98,101]. Because the studies indicate that teachers' approach to teaching affect students' approaches to teaching and their learning process[20,29,31,52,60,61,95,97]. For example the students whose teacher adopts student centered approaches and carries out student centered instructional methods have deep learning insight on the other hand students whose teacher adopts traditional teaching concept that forms around objectivist paradigm have more surface learning insight [24,40,96,97]. Furthermore Gow and Kember [31] indicate that teachers' teaching concepts affect the students' learning approach.

There are various classifications about teachers' teaching approach. Martin and Balla [65] determined three teaching approaches which are (a) "encouraging active learning", (b) "learning facilitation" and (c) "presenting information". Trigwell and Prosser [93,95] classified teaching approaches as teacher centered and student centered. Also Gow and Kember [31] categorized teaching approaches as 'learning facilitation' and 'knowledge transmission'. Chan and Elliott

[13] indicate that teachers have two conceptual insight about teaching learning which are constructivist teaching concept and traditional teaching concept.

Traditional teaching conceptual perception has formed around objectivist approach and has characterized by teacher centered perception or information transmission. Generally traditional teaching includes teaching with teacher centered instructional methods and techniques that's why students characterized as passive knowledge recipient. Teachers play the role of knowledge transmitter. Learners are builders of knowledge with regard to constructivist concept which is characterized as part of the student centered approach. So teacher is a designer of a classroom in which teacher supports students' knowledge building, a facilitator and coach of learning. Constructivist concept assumes that knowledge has a complicated structure, depends on learner and is formed by learner's experiences and beliefs [9,26,31,49,53]. That's why teacher is the designer of learning environment and facilitator of learning in classrooms. Teacher prepares active learning tasks for students [22, 102, 103].

In the traditional approach teacher transmit the information to students. Students are regarded as passive recipients of information. Traditional classes are usually dominated by lecture or direct instruction. Students are expected to accept information without questioning. There is little interaction between students in learning process. Students learn independently [13,48]. In the traditional or teacher focused approach teachers generally assume that students have the same level of background knowledge in the subject matter and are able to absorb the learning material at the same way [27,63,90].

In contrast, in the constructivist classes students work or learn together in small groups to interact with peers. Teacher helps the students to construct actively their own meaning on previous knowledge, prior experiences and beliefs. Students learn active experiments. Constructivist classes are dominated interactions between students. The constructivist teachers design learning environments to help students to formulate ideas, to make inferences and draw conclusions through problem solving, inquiry- based learning activities [1,30].

Teachers' teaching and learning approach affects the students' learning approach [29,52,97]. So there are many studies about improving and changing teachers' learning and teaching approaches [28,89]. Teachers' teaching approach can be affected by many variables. Studies show that teachers' teaching approaches are affected by different factors such as knowledge, self-confidence, belief and attitudes [26,29,79]. For instance Ekinci [25] indicated that educational experiences affect learning and teaching approaches. Epistemological beliefs are one of the variables that affect teachers' teaching approaches and insight [42,67]. Epistemological belief can be explained as personal beliefs about what knowledge is and how learning occurs [80]. Schommer [82] pointed out that regarding epistemological beliefs as just about knowledge is a limited approach. Also

he indicated that epistemological beliefs not one dimensional concept which is only about knowledge. It is a multidimensional concept which includes process of getting and using knowledge so it should be regard as a belief system. Briefly epistemological beliefs are about people's knowledge and learning beliefs[19].

Epistemological beliefs are classified variously. For example Perry [75] expressed that students move from dualistic (knowledge is true or false) point of view to multiplicity conceptions of knowledge then move to relativism (knowledge is interpreted as contingent and contextual). Another classification type belongs to King & Kitchener [55] who found out five stage improvement model. As for Hofer [41] claimed that epistemological belief has two dimensions. This study also based on another classification type which indicated by Schommer [80] as naive and sophisticated epistemological beliefs. Schommer [83] proposed that each dimension of epistemological beliefs was independent from the others and that it was not necessary to demonstrate all of the dimensions at the same time. Deryakulu & Büyüköztürk [18,19] adapted the scale to Turkish culture and they indicated that this scale has three factors which are "The belief of learning depends on effort (BLDE)", "The belief of learning depends on ability (BLDA)" and "The belief of there is only one true truth (BOTT)".

Besides being important research area, epistemological beliefs have philosophical essentials. There are many epistemological belief studies carried on different type of samples such as teachers, teacher candidates and students in literature. [18,64,69]. For example the study which aims to compare teacher candidates and learning environment indicated that teacher candidates' epistemological beliefs about mathematics are affected by teaching approaches [34]. Silverman [86] claims teachers' attitudes and epistemological beliefs have direct effect on their relations with students and classroom environment. In that sense the purpose of this study is to investigate the teacher candidates' epistemological beliefs' effect on teaching approaches and to test the following hypothesis.

There are two studies about determining the teacher candidates' epistemological beliefs have similar results [57,69]. These results show that teacher candidates' naivest belief is that there is only one true truth and their most sophisticated belief is that learning depends on effort. It can be claimed that these results derived from teachers who adopts traditional teaching. In the teacher centered, only one source based and designated for lecturing classrooms, students who are passive during learning and teaching process believe there is only one true truth. Students cannot realize different point of views and cannot improve more point of views in the classrooms where teachers do not used diverse instructional methods [57]. Reviewing teaching approaches might be useful with the aim of improving students' epistemological beliefs. Moreover it is recommended that educational programs should be based on constructivist concept. ([44] cited:[57]). Therefore there is a

positive relation between traditional teaching concept and epistemological belief in single truth. Also it is supposed to be negative relation between constructivist teaching concept and the belief of there is only one true truth.

Ravindran, Greene & DeBacker [78] study result shows that there is a relation between teacher candidates' epistemological beliefs and their learning purpose and learning process. Another study results indicate that teachers' epistemological beliefs have effect on their type of teaching conceptualizing [13]. The belief of there is only one true truth is related to learning paradigm based on objectivist approach [22,48]. Objectivist teaching-learning concept reflects traditional teaching concept. With regard to this perspective following hypothesis can be claimed:

H1: The “beliefs of there is only one truth (BOTT)” positively impact “traditional teaching concept (TTC)” of preservice students.

H2: The “beliefs of there are only one truth (BOTT)” is negatively impact “constructivist teaching concept” (CTC) of preservice students.

There is a significant positive relation between the belief of learning depends on ability (BLDA) and essentialism philosophy of education on the other hand there is a meaningful negative relation between BLDA and perennialism, progressivism and existentialism [6]. According to Gutek[35] while essentialism aims to improve the cognitive skills with respect to progressivism teaching is based on real life problems. In addition to these results, Aypay [4] indicated that the so far as the belief of learning depends on effort (BLDE) appears in classrooms constructivist teaching concept has been accepted. At the same time traditional teaching concept has been accepted so far as the belief of there is only one truth and the belief of learning depends on ability rise in education.

Lonka and Ahola [62] made a comparison between student centered classrooms and teacher centered classroom in terms of improved student approach including constructivist epistemology, studying ability and academic achievement. The result of this comparison shows that student centered teaching is more effective than teacher centered teaching. Constructivist teaching concept emphasizes the experience, practice and previous knowledge instead of ability [22,48]. So it can be expressed that there is a positive relation between traditional teaching concept and the belief of there is only one truth but there is a negative relation between constructivist teaching concept and the belief of there is only one truth. So the following hypothesis can be suggested:

H3: The “belief of learning depends on ability (BLDA)” is a positive predictor of students' insight about “traditional teaching concept (TTC)”.

H4: The “belief of learning depends on ability (BLDA)” is a negative predictor of students' insight about “constructivist teaching concept (CTC)”.

Constructivist teaching concept focuses on students' understanding of learning in terms of different point of views and advanced learning environment. The belief of learning

depends on effort requires that student should be assigned process oriented tasks in learning environment [73,91]. Therefore there is a positive relationship between BLDE and students' insight about constructivist teaching concept (CTC). Also Howard, McGee, Schwartz & Purcell [44], found out that teachers' beliefs affect their teaching methods in their study. In other words teachers' epistemological beliefs affect their teaching strategies, problem solving approaches and their efforts for program adaptation. In similar researches [12,13,70] a positive relationship determined between epistemological beliefs and the conceptions based on constructivist teaching concept. That result points out there might be a relationship between the beliefs of learning depends on effort and teaching approaches. Cheng, Chan, Tang & Cheng [15] determined a positive relationship the belief of learning depends on effort and teaching approaches. The belief of learning depends on effort is a part of sophisticated epistemologies in Schommer's [80] scale. On the other hand naive epistemologies take part in traditional and objectivist epistemologies [22]. People who have the belief of learning depends on effort think that learners should be active in learning process. If learning depends on effort, learners can construct knowledge so long as they have open ended tasks. This result is directly related with constructivist perspective. With respect to traditional teaching concept related with positivist paradigm that points out knowledge is presented to students by teachers. If it is considered that beliefs have significant impact on changing from preservice teachers' traditional teaching perceptions to their constructivist teaching – learning perceptions these two perceptions are affected by epistemological belief in different levels. So the following hypothesis can be suggested:

H5: The “belief of learning depends on effort (BLDE)” is a negative predictor of students' insight about “traditional teaching concept (TTC)”.

H6: The “belief of learning depends on effort (BLDE)” is a positive predictor of students' insight about “constructivist teaching concept (CTC)”.

Teachers' point of view about learning has significant impact on their teaching strategies and learning approaches [29,52,76]. Teachers' improving a deep insight and a conceptual change is directly about their teaching approach. Students' can have more deeply understanding and attend learning process actively if their teacher decides to appropriate teaching approach[95,97]. Balck & Ammon [7] and John [46] points out the importance of experiences at moving from traditional teaching to constructivist teaching. So using constructivist teaching methods instead of traditional methods is considered as important [23,63,100]. Traditional teaching concept that is characterized by objectivist epistemology has exactly opposite position to constructivist teaching concept [33,47,50,58]. So certain research results determined negative correlation between traditional teaching concept and constructivist teaching concept [54,66,77,88]. Moving preservice teachers' conceptual change about traditional teaching to

constructivist based teaching requires a significant changeover about their perceptions. So the following hypothesis can be suggested:

H7: “Traditional Teaching Concept (TTC)” negatively significant impact on “Constructivist Teaching Concept (CTC)” of preservice teachers.

2. Method

2.1. Participants

990 teachers' candidate voluntarily involved to this study. There were 610 (61.61%) female participants and 380 (38.39%) male participants. All teacher candidates complete pedagogy courses and teaching internship. 375 (37.88%) participants are in science majors, 417 (42.12%) are in social science and 198 (20%) participants are in other majors like music, psychical education. In this study, the data are collected in spring term of 2015-2016 education years.

2.2. Instruments

In the study, the data gathered two scales. One of them is “Epistemological Belief Scale (EBS)”. EBS is originally developed by Schommer [80]. EPS originally has 63 items and four factors as “Fixed Ability”, “Learning is done at once”, “Knowledge is simple” and “Knowledge is certain”. Deryakulu and Büyüköztürk [18] adopted the scale in Turkish culture. 28 items are removed from the original scale during adopting process by Deryakulu and Büyüköztürk [18]. Also, Deryakulu and Büyüköztürk [19] quited item 24 because of its low factor loading score and finally, the scale has 34 items and 3 factors. First factor is called as “The belief of learning depends on effort (BLDE)”, and includes 17 items, second factor is called as “The belief of learning depends on ability (BLDA)” and includes 9 items, and the

third factor is called as “The belief of there is only one true truth (BOTT)” and includes 8 items. The survey questions were based on 5-point Likert scale for perceptions ranging from a low score of 1 (*I never agree*) to a high score of 5 (*I absolutely agree*). The high points get from each factor of the scale indicate that the person has matured and sophisticated beliefs related to that factor. The repetition reliability of the original scale is .74, while the reliability coefficients of the factors change between .63 and .85 [81]. The Cronbach Alpha coefficients of the adapted version consists of the 34-items are .84 for the first factor, .69 for the second factor, .64 for the third factor and .81 for the whole scale [19]. Can and Arabacıoğlu [11], and Oğuz [69] used the adapted version of the Epistemological Belief Scale, and found the similar Cronbach's Alpha coefficient. In this study, the Cronbach's Alpha coefficient is .80 for all items of the Epistemological Belief Scale, .78 for BLDE factor, .71 for BLDA factor, and .81 for BOTT factor.

The second scale which is used in this study is “Teaching-Learning Conceptions Scale (TLCS)”. It was developed by Chan and Elliott [13] and was adapted to Turkish culture by Aypay [4]. The survey questions were based on 5-point Likert scale for perceptions ranging from a low score of 1 (*I never agree*) to a high score of 5 (*I absolutely agree*). The scale has 30 items and 2 factors. First factor is called as “Constructivist Teaching-Learning Conception (CTC)”, and includes 12 items; second factor is called as “Traditional Teaching-Learning Conception (TTC)” and includes 18 items. Aypay found reliability of the TLCS via Cronbach's Alpha, and it is .84 for the total of 30 items, .88 for the CTC factor, and .83 for TTC factor. In this study, the researchers figure the reliability out for .88 for the total of 30 items, .90 for the constructivist teaching-learning conception factor, and .91 for traditional teaching-learning conception factor..

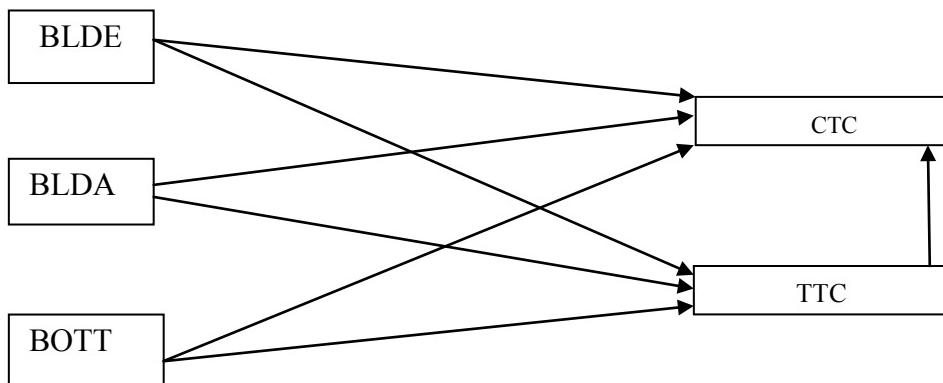


Figure 1. Proposed Model

2.3. Data Collection and Analysis Process

The researchers collected the data from participants via hard copies of survey. Firstly, descriptive analysis is applied to collected data, and then Structural Equation Model is conducted to explore how epistemological beliefs predict teaching approaches. The following model has been tested as part of hypothesis

The proposed model in this study has multiple relationships which are highly complex variables. This type of model having constructs with many indicators or manifest variables can be best analyzed using SEM [16,37]. There are two forms of SEM approaches – Covariance based SEM (CBSEM) and the variance-based SEM which uses partial least squares (PLS-SEM). We used PLSEM for the analysis of this model due to its multiple indicator variables and non-normal distribution of the data which is required for CB-SEM. In the research path analysis model was conducted with observed variables.

3. Results

3.1. Descriptive Statistics

The descriptive statistics results about conceptual perceptions of teacher candidates' epistemological beliefs and teaching approaches are presented in Table 1.

"The belief of learning depends on effort (BLDE)" has the highest mean of Epistemological Belief Scale (EBS) (Mean = 3.44, sd=.96). "The belief of there is only one true truth (BOTT)" has (Mean=2.94, sd=.70) and "The belief of

learning depends on ability (BLDA)" has (Mean=2.52, sd=.75). The results showed that teacher candidates' epistemological beliefs depend on "The belief of learning depends on effort". According to Teaching-Learning Conceptions, "constructivist teaching-learning conception (CTC)" has the high mean (Mean=3.65, sd=.73) and "traditional teaching-learning conception (TTC)" has the low mean (Mean=2.76, sd=.68). The belief of learning depends on effort significantly affect teacher candidates' epistemological beliefs more than the BOTT and the BLDA.

3.2. Correlation Analysis

Pearson correlation analysis conducted to explore the conceptual relationship between teacher candidates' epistemological belief and teaching-learning conception. Pearson correlation coefficients and the level of significance are presented in Table 2.

Table 2 shows Pearson correlation coefficients of each possible pairing of one of two teaching learning concept approaches and one of three dimensions of epistemological beliefs. Conceptual relationship between teacher candidates' epistemological belief and teaching-learning conception are determined. While, there is a negative relationship between CTC and the BLDA ($r=-0.39$, $p<0.001$), and the BOTT ($r=-0.20$, $p<0.001$), there is a positive relationship between CTC and the BLDE ($r=0.67$). There is a positive relationship between TTC and the BLDA ($r=0.50$, $p<0.001$), and the BOTT ($r=0.60$, $p<0.001$); on the other hand, there is a negative relationship between TTC and the BLDE ($r=-0.24$).

Table 1. Descriptive Statistics Results

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
BLDE	990	1	4.82	3.44	.96	-.078	.292
BLDA	990	1	4.88	2.52	.75	.491	-.348
BOTT	990	1	5.00	2.94	.70	.029	.308
CTC	990	1	5.00	3.65	.73	-.440	-.171
TTC	990	1	5.00	2.76	.68	.350	.435

Table 2. Relationship between epistemological beliefs and learning-teaching conception

	BLDE	BLDA	BOTT	CTC	TTC
The belief of learning depends on effort (BLDE)	1				
The belief of learning depends on ability (BLDA)	-.390**	1			
The belief of there is only one true truth (BOTT)	-.200**	,423**	1		
Constructivist Teaching Concept (CTC)	,670**	-,429**	-,239**	1	
Traditional Teaching Concept (TTC)	-,241**	,500**	,601**	-,299**	1

* $p<.001$

3.3. Evaluation of Structural Model

To study causal relationship of epistemological beliefs and learning-teaching conceptual approaches, path analysis was applied. The criteria used for structural model evaluation in PLS-SEM analysis are the values of the coefficient of determination (R^2) for endogenous variables, strength and significance of path coefficients, and the prediction relevance of the model [16]. The predictive power of the model is assessed by the R^2 values of the endogenous constructs [36]. The variance explained in three endogenous variables, which included BLDE, BLDA, and BOTT on CTC and TTC, are summarized in Table 3, which demonstrates low to moderate predictive power in different constructs except BOTT on CTC [39]. The structural model is strength and significance of the path coefficients between the exogenous variables and the endogenous variables. Goodness of fit index was obtained was perfect, confirming the proposed model of relations between the

dimensions of epistemological beliefs and teaching-learning concepts. Table 3 presents the R^2 values, t-statistics and p-values for all endogenous variables from the model analysis.

The results from Table 3 indicate a strong relationship between BLDE and CTC with a path coefficient of 0.54 ($t=21.03$, $p<0.000$). A strong relationship between BOTT and TTC with a path coefficient of 0.46 ($t=17.20$, $p<0.000$). The relationship between BOTT and CTC is not determined ($t=-1.16$, $p>0.05$). The other relationships between epistemological belief and teaching-learning conception are very weak. Figure 2 presents a summary of the relationships in the model, the significant paths and the R^2 values.

The results of our hypotheses testing are summarized in Table 3. Except H_2 , all hypotheses are supported. Most importantly, there is significant direct support of the impact of epistemological beliefs on teaching-learning concepts.

Table 3. R^2 Values and t Statistics

		Path	t	p	Hypothesis
H_1	BOTT \rightarrow TTC	.46	17.20	.000**	Supported
H_2	BOTT \rightarrow CTC	-.03	-1.16	.073 (n.s)	Rejected
H_3	BLDA \rightarrow TTC	.27	9.62	.000**	Supported
H_4	BLDA \rightarrow CTC	-.15	-5.30	.000**	Supported
H_5	BLDE \rightarrow TTC	-.07	-2.52	.000*	Supported
H_6	BLDE \rightarrow CTC	.54	21.03	.000**	Supported
H_7	TTC \rightarrow CTC	-.10	-3.28	.000*	Supported

R^2 for CTC=.49
 R^2 for TTC=.44

** $p<.01$; * $p<.05$; n.s=not significant

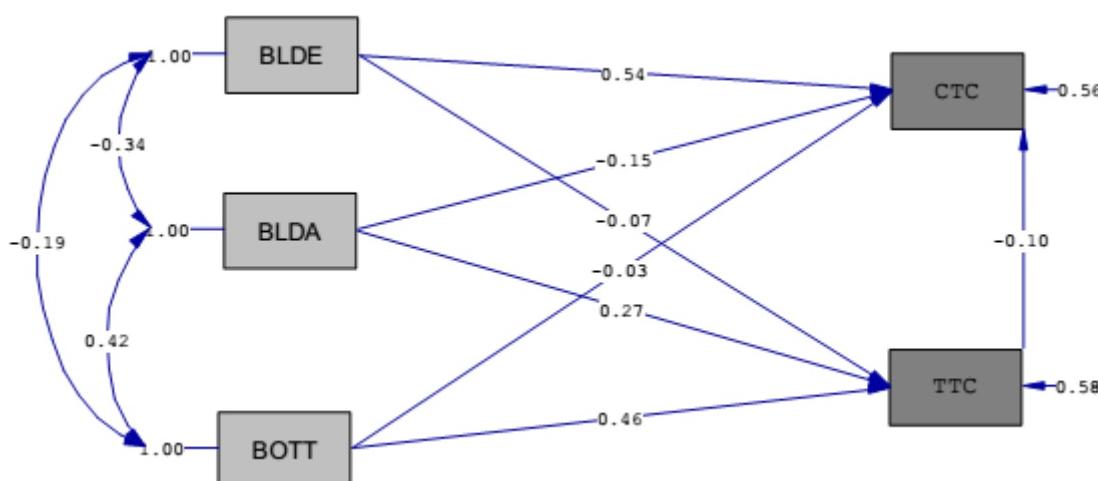


Figure 2. Standardized Path Diagram

4. Conclusion and Recommendations

This study investigated how teacher candidates' three different type of epistemological belief effect on teaching-learning conception. According to descriptive statistics results, "The belief of learning depends on effort (BLDE)" has the highest mean of Epistemological Belief. The belief of learning depends on ability, and the belief of there is only one true truth of Epistemological Belief have lower means. The results of this study support the results of previous studies which were carried out by Belet and Güven [5], Aypay[3], and Chan and Elliot [13]. While, BLDA and BOTT promotes teacher candidates positivist attitudes are lower ([45,48,51] than the BLDE which promotes post-positivistic is higher [2,27,92]. In addition, the study of Can and Arabacıoğlu [11] provides the belief of learning depends on effort.

Moreover, this research stressed teaching-learning concepts of teacher candidates. The mean of constructivist teaching-learning conception is higher than traditional teaching-learning conception. The results show that teacher candidates are improving a constructivist teaching-learning conception. The Ministry of National Education (2005) processed a reform that might affect these results to change over from traditional to constructivist teaching-learning conception. Turkish education system makes effort for this transformation in teacher education programs at higher education. Furthermore, developing of information and communication technologies and its conceptions have an effect on teaching-learning conceptions [10,38]. Previous studies in a manner like that students' constructivist conception of teaching and learning score are higher [14,72].

According to Pearson correlation results, while there is a positive relationship between BLDE and CTC, there is a negative relationship with TTC. Additionally, there is a negative relationship between CTC and BLDA and BOTT factors of Epistemological Belief, there are a positive relationship between CTC and BLDE factor. However, there is a positive relationship between TTC and BLDA, and BOTT factors of Epistemological Belief, there are a negative relationship between traditional teaching-learning conception and BLDE factor. Moreover, there is a negative relationship between CTC and TTC. There is a negative relationship between BLDE factor of Epistemological Belief, and BLDA and BOTT; nevertheless, there is a positive moderate relationship between BLDA and BOTT factors. The relation between epistemological beliefs and teaching-learning conceptual approach were also confirmed by Structural Equation Modelling. The belief of learning depends on innate ability and the belief of there is only one true truth handled on objectivist epistemological beliefs [22,58]. The objectivist reflection of teaching-learning conception characterized with traditional concept [48]. The results of this study supported previous conceptual studies [21,32,71,80] and some researches' results [13,85] in literature. For instance, Aypay [found that there is a negative

and low relationship between BOTT and CTC, and there is a positive and moderate relation with TTC.

Path analysis results showed that BOTT is not predicting CTC; on the other hand, BLDE is strongly predicting on CTC. In addition, the results claimed that BOTT is strongly predicting on TTC. The previous studies results of Cheng et al., [15], and Ozkal, et al., [73] supported this study. Otting, et al., [72] provided that there is a positive relation between BLDE and CTC, but negative relation with TTC. Also BOTT is not predicting on CTC. All of the hypotheses except one are supported. In summary, research results indicate that epistemological beliefs have an effect on teaching-learning conception.

Therefore, the results provided that teacher candidates' epistemological beliefs are predicting on teaching-learning conception. While, BLDA and BOTT factors of epistemological beliefs are predicting traditional teaching-learning conceptual, BLDE factor of epistemological beliefs is predicting constructivist teaching-learning conception. As a result of this study, it might be said that teacher education programs might offer some courses and practices to promote preservice teachers' epistemological beliefs about student centered education. Especially, the success of education reforms depends on focus on teacher education programs which promote preservice teachers' constructivist teaching-learning methods. Additionally, teacher education program might provide courses for developing visions of preservice teachers about education philosophy and thinking skills to recognize student centered education. This study investigated the effects of teacher candidates' epistemological beliefs on teaching-learning conception. Future studies might carry out the effects of different variabilities such as teachers' attitudes, self-efficacy, and approaches on teaching-learning conception.

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